1
1 1
1 2 1
1 3 3 1

6.3 / 1, 2, 6, 8 Final Thurs 1/21 10:15

① $5+10+15 \ldots 5n = \frac{5}{2}n(n+1)$ $\quad 5 = \frac{5}{2}(2) = 5$ ✓

$5+10+15 \ldots 5n+5(n+1) = \frac{5}{2}n(n+1) + 5n+5$

$\frac{5n(n+1)}{2} + \frac{10n+10}{2}$

$\frac{5n^2+5n+10n+10}{2}$

$\frac{5(n^2+3n+2)}{2} = \frac{5(n+1)(n+2)}{2}$ ✓

want to $\frac{5}{2}(n+1)(n+2)$

② $10+10^2+10^3 \ldots 10^n = \frac{10}{9}(10^n-1)$ $\quad 10 = \frac{10}{9}(9) = 10$

$10^n + 10^{n+1} = \frac{10}{9}(10^n-1) + 10^{n+1}$

$\frac{10^{n+1}-10+9(10^{n+1})}{9}$

$\frac{10(10^{n+1})-10}{9}$

want to $\frac{10}{9}(10^{n+1}-1)$

$\frac{10}{9}(10^{k+1}-1)$

⑥ $\frac{1}{1\cdot4} + \frac{1}{4\cdot7} + \frac{1}{7\cdot10} \ldots + \frac{1}{(3n-2)(3n+1)} = \frac{n}{3n+1}$ $\quad \frac{1}{4} = \frac{1}{3+1} = \frac{1}{4}$

$\frac{1}{(3n+1-2)(3n+1+1)} = \frac{n}{3n+1} + \frac{1}{(3n+1)(3n+4)}$

$\frac{3n^2+4n+1}{(3n+1)(3n+4)}$

$\frac{(3n+1)(n+1)}{(3n+1)(3n+4)} = \frac{n+1}{3n+4}$

want to $\frac{n+1}{3n+4}$

⑧ 9 is factor of $n^3+(n+1)^3+(n+2)^3$. $\quad n=1$: $1+2^3+3^3 = 1+8+27 = 36$ ✓

$n^3+n^3+3n^2+3n+1+n^3+3n^2+6n+8$

$3n^3+6n^2+9n+9$

$\frac{3n^3+6n^2+9n+9}{9}$ NO!

$1^3+2^3+3^3 = 8+27+64 = 99$

$x^2 - 2xa + a^2$

$y^2 - 2yb + b^2$

$x^2b^2 - 2xab^2 + a^2b^2$

$-2x^2yb + 4xayb - 2ya^2b$

3)

$$(x-a)^2 + (y-b)^2 = \frac{a\,6\,s(mx-y+c)}{\sqrt{m^2+1}}$$

$$[(x-a)^2 + (y-b)^2]^2 = \frac{(mx-y+c)^2}{m^2+1}$$

$$(x-a)^4 + 2(x-a)^2(y-b)^2 + (y-b)^4 = m^2x^2 - 2mxy + 2mxc - 2cx + y^2 + c^2 / m^2 + 1$$

$$x^4 - 4x^3a + 6x^2a^2 - 4xa^3 + a^4 + y^4 - 4y^3b + 6x^2b^2 - 4y^1b^3 + b^4 +$$

$$x^2 - 2ax + a^2 + y^2 - 2by + b^2 \longrightarrow$$

$$x^2 + y^2 - 2(ax + by) +$$